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## SYNTHETIC CHEMICALS UNDER THE WAR REVENUE ACT.

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(A paper read before the Washington Chemical Society, February 8, 1900.)

Schedule B, of the War Revenue Act, provides for a stamp tax upon medicinal proprietary articles and preparations, as follows:

“ Medicinal proprietary articles and preparations: For and upon every packet, box, bottle, pot or phial, or other inclosure, containing any pills, powders, tinctures, troches or lozenges, sirups, cordials, bitters, anodynes, tonics, plasters, liniments, salves, ointments, pastes, drops, waters (except natural spring waters and carbonated natural spring waters), essences, spirits, oils, and all medicinal preparations or compositions whatsoever, made and sold, or removed for sale by any person or persons whatever, wherein the person making or preparing the same has or claims to have any private formula, secret or occult art for the making or preparing the same, or has or claims to have any exclusive right or title to the making or preparing the same, or which are prepared, uttered, vended or exposed for sale under any letters-patent, or trade-mark, or which, if prepared by any formula, published or unpublished, are held out or recommended to the public by the makers, venders or proprietors thereof as proprietary medicines, or medicinal proprietary articles or preparations, or as remedies or specifics for any disease, diseases or affection whatever affecting the human or animal body. . . . . ”

This is seen to be a comprehensive list, covering quite thoroughly the entire field of pharmaceutical preparations.

Section 20 of the law, however, containing the penal clause, has also a proviso which makes certain exemptions from Schedule B, and at the same time extends the scope of the law, as follows:

*"Provided:* That no stamp tax shall be imposed upon any uncompounded medicinal drug or chemical, nor upon any medicine sold to or for the use of any person which may be mixed or compounded for said person according to the written recipe or prescription of any practising physician or surgeon, or which may be put up or compounded for said person by a druggist or pharmacist selling at retail only. The stamp taxes provided for in Schedule B of this Act shall apply to all medicinal articles compounded by any formula, published or unpublished, which are put up in style or manner similar to that of patent, trade-mark or proprietary medicine in general, or which are advertised on the package or otherwise as remedies or specifics for any ailment, or as having any special claim to merit, or to any peculiar advantage in mode of preparation, quality, use or effect."

It will be seen that the first paragraph of this proviso has the effect of restricting the scope of Schedule B; first, by exempting *uncompounded* drugs and chemicals, and, second, by exempting compounded preparations when prepared by direction of a physician. The last paragraph, on the other hand, *extends* the scope of Schedule B, by applying it to preparations which, though not patent, trade-mark or proprietary medicines, are "put up in style or manner similar to proprietary medicines in general."

The first regulations issued by the Commissioner of Internal Revenue in execution of the Act made no attempt to define what was or was not an "uncompounded drug or chemical," the ambiguous character of this term having been early recognized. In fact, this question was not raised, the earlier contentions in regard to the scope of the law having been mainly with pharmacists and pharmaceutical manufacturers over the interpretation of the phrase, "put up in style or manner similar to patent, trade-mark, or proprietary medicines in general."

Several months after the law was in operation, some of the importers of the class of medicines known as patented synthetics made a move upon the Internal Revenue Office, claiming exemption for their medicines as uncompounded chemicals, and rebate of tax upon such as had been sold. The Commissioner refused to so consider them, and the contention was taken into court upon a sort

of an agreed case, the proceedings being in the nature of an action *in rem*, against twelve articles of this class, viz., aristol, phenacetin, europhen, piperazine, protargol, losophan, lycetol, sulphonal, tannigen, tannipine, trional and salophen, all products of the Farbenfabriken of Elbersfeld Co. A jury trial was waived and testimony taken before the District Judge of the Southern District of New York.

It was admitted that the articles in question were trade-marked or patented, or both, but it was claimed that they were exempt under the proviso, as uncompounded chemicals.

A large number of experts testified in the case, including persons prominent in chemistry, pharmacy and medicine. By these experts, the importers aimed to show that while the articles in question were known as chemical *compounds*, they were not *compounded* in the sense in which the word is used in medicine and pharmacy; that, while composed of different elements, these elements were combined in such a way that the constituents had lost their individualities, while the compound acquired a being or individuality entirely its own, with characteristics and properties peculiar to itself and distinct from other compounds—different and distinct also from the properties of the various constituents of which it was composed. In pharmacy, on the other hand, it was shown that *compounding* is understood to mean the mechanical mixing of two or more different substances where no chemical union takes place, the resultant compound having no distinctive features peculiar to itself, but retaining the characters of all its constituents.

The Government, while admitting in general the contentions above stated, argued that the design of Congress was to tax, primarily, *proprietary* medicines, even to the extent of including medicines which imitated or counterfeited proprietary medicines; that this object would be defeated if the desired construction was placed upon the law, as it would result in relieving a medicine which could be designated as an uncompounded chemical from any restriction whatever, so that quinine, for example, could be sold unstamped as "Smith's Ague Cure," or under any patent or trade-mark designation, so long as it were unmixed with other substances. Moreover, Congress deals with broad and general meanings, and could not be expected to note such delicate distinctions as that between *chemical* compounding and *pharmaceutical* compounding, between cohesion

and chemical attraction. The court upheld the technical construction of the law, and decided the articles in question to be exempt from tax. The decision (published as Treasury Decision No. 20634; 91 Fed. Rep., 608) is quite a clear and comprehensive discussion of the disputed points, and marks out, with a considerable degree of exactness, the distinction between a *compounded* and *uncompounded chemical*, basing it entirely upon the question whether the substance in question is or is not a distinct chemical species unmixed with any other substance. It is worthy of note, however, as an indication of the difficulty experienced by a layman in dealing with the extensive field of substances used in medicine, that Justice Brown, in his decision, classes *opium* with quinine as a chemical compound, while he puts *alkaloids* along with tinctures, extracts, etc., in the category of pharmaceutical compounds. Little light is thrown upon the more difficult question of the definition of an uncompounded *drug* as distinguished from an uncompounded *chemical*.

The decision was accepted by the Commissioner of Internal Revenue, and regulations issued in accordance therewith, providing for the submission, in the case of an article claiming exemption, of a sample for chemical analysis or examination, the result to govern the action of the office in the premises.

These samples have occupied a large share of the time of the Chemical Division of the Internal Revenue Office during the past year, the analytical work having been performed chiefly by Mr. Simons. A complete ultimate analysis was not found necessary in any case, the estimation of the nitrogen in bodies containing it, or halides or metallic bases in others, together with the determination of melting points, solubilities and other characteristics, usually serving to establish the identity and individuality of a chemical, although it will be seen that each sample required a separate investigation and study, in some cases constituting quite a puzzle, as chemical literature is very scant concerning them. The work has been interesting in many ways, however, more particularly on account of the interest attaching to the preparations as representing the products of the skill of the synthetic chemist.

It would be highly interesting, no doubt, to make a study of the class from any one of three different points of view, of the chemist, the pharmacist or the physician, but such a presentation of the subject would be entirely outside the limits of our time, and we aim

to give you to-night only a general idea of the work we have been doing. Most of you are doubtless aware of the marvellous rapidity which has marked the development of the use of this class of remedies in medicine, and the consequent increase in the variety of different compounds discovered and manufactured for such use. Antipyrin was about the first to attract general attention, and, as the patent on this has recently expired, it will be seen that all have been originated within the past fifteen years.

The contention over the construction of the act, which we have previously described, affords, in itself, a further illustration of the very recent origin of the class, in this way; the language of Section 20 of the Act, including the phrase "uncompounded chemicals," was taken almost word for word from the old War Revenue Act, the proprietary medicine feature of which was repealed in 1883; during the operation of that Act no question was ever raised as to the exemption of proprietary medicinal articles as uncompounded chemicals, for the very good reason that, as we have seen, there were no chemical compounds which were patented or proprietary, the large class of patented synthetic chemicals having been originated subsequent to the repeal of the law.

The extent and variety of their present use may be well shown by the size of these reference books, Coblenz and Thoms, which are merely lists of the remedies in question, giving very briefly the principal characteristics of each substance with no extended description.

Coming now to our work on these chemicals, the following list of medicinal articles represents those which have been examined, and having been found to be definite chemical compounds, are, therefore, uncompounded chemicals, and exempt from payment of tax as proprietary remedies (Treasury Decisions, No. 21,875).

Acid carbolic Merck (phenol).

Agathin (salicyl-methyl-phenyl-hydrazone).

Airol (bismuth oxy-iodo-gallate).

Alumnol (beta-naphthol-disulphonate of aluminum).

Antifebrin (acetanilid).

Antiseptic credé (citrate of silver).

Apolysin (mono-phenetidin citric acid).

Aristol (di-iodo-dithymol).

Baking soda (bicarbonate of soda), Arm & Hammer brand.

- Baking soda, Cow brand.
- Benzosol (guaiacol benzoate).
- Beta-euaine (hydrochloride of benzoyl-vinyl-diaceton-alkamin).
- Blennostasine (cinchonidine dibromide).
- Bromalin (hexamethylene-tetramine-brom-ethylate).
- Chloralamid (chloral-formamid).
- Dermatol (bismuth subgallate).
- Dithion (dithiosalicylate of soda II).
- Duotal (guaiacol carbonate).
- Eudoxine (bismuth salt of tetraiodo-phenolphthalein).
- Euphthalmine (hydrochloride of methyl-vinyl-diacetone-alkamine-phenyl-glycolyl).
- Euphorine (phenyl-urethane).
- Euquinine (ethyl-carbonic ester of quinine).
- Europhen (isobutyl-ortho-cresol-iodid).
- Exalgine (methyl-acetanilid).
- Ferropyrine or ferripyryne (ferric-chloride-antipyrine).
- Formalin (solution of formaldehyd).
- Geosot (guaiacol valerianate).
- Guaiacol-salol (guaiacol salicylate).
- Guajacetin (pyro-catechin-mono-acetic acid).
- Guaiquin (quinine guaiacol-bisulphonate).
- Heroin (acetic ester of morphine).
- Holocain (para-diethoxy-ethenyl-diphenyl-amidin hydrochloride).
- Hydrogen dioxide, Oakland brand.
- Hypnal (mono-chloral-antipyrin).
- Iodole (tetra-iodo-pyrrol).
- Kryofine (methyl-glycollic-phenetidin).
- Lactophenin (lactyl-phenetidin).
- Losophan (tri-iodo-meta-cresol).
- Lyoetol (dimethyl-piperazin tartrate).
- Lysidine (methyl-glyoxalidin, solution in water).
- Neurodin (acetyl-p-oxy-phenyl-urethane).
- Oleoguaiacol (guaiacol oleate).
- Orphol (beta-naphtholate of bismuth).
- Orthoform hydrochloride (methyl-para-amido-meta-oxybenzoic hydrochloride).
- Orthoform, new (methyl-meta-amido-para-oxy-benzoate).
- Parachlor-salol (salicylate of chlor-phenol).

- Paraform (para-formaldehyd).  
Phenacetin (para-acet-phenetidin).  
Phenocoll hydrochloride (amido-aceto-para-phenetidin hydrochloride).  
Piperazine (diethylene-diamin).  
Protargol (silver and albumen).  
Pyoktanin yellow (imido-tetramethyl-di-p-amido-diphenyl-methan chloride).  
Pyramidon (di-methyl-amido-phenyl-dimethyl-pyrazolon).  
Pyrodin (acetyl-phenyl-hydrazin).  
Quinalgen (ortho-oxyethyl-alpha-benzoyl-amido-quinolin).  
Salacetol (salicyl-acetol).  
Salipyrin (salicylate of antipyrin).  
Salol (phenyl salicylate).  
Salophen (acet-o-para-amido-salol).  
Sozoiiodole mercury (sozoiiodolate of mercury).  
Sozoiiodole sodium (di-iodo-para-phenol-sulphonate of sodium).  
Sozoiiodole zinc (sozoiiodolate of zinc).  
Sulphonal (diethyl-sulphon-dimethyl-methan).  
Stypticin (cotarnine hydrochlorate).  
Tannoform (methylene-ditannin).  
Tannigen (diacetyl-tannin).  
Tannopine (hexamethylene-tetramine-tannin).  
Thermodin (acetyl-para-ethoxy-phenyl-urethane).  
Trional (di-ethyl-sulphone-methyl-ethyl-methan).  
Triphenin (propionyl-phenetidin).  
Tussol (antipyrin mandelate).  
Urotropin (hexa-methylene-tetramine).  
Water, distilled.  
Xeroform (tribrom-carbolate of bismuth).

The pharmaceutical profession has been discussing of late the propriety and advisability of admitting some of the patented synthetics to the U. S. Pharmacopeia at the next (1900) decennial revision. Should this be done, it is likely that only such as have been shown to have a definite chemical structure, together with valuable medicinal properties, would be recognized in this way, and the work represented by the foregoing list may prove of some value in that connection as well.

It would seem, at first sight, a very simple proposition to deter-

mine whether a substance in hand is or is not a definite chemical species or entity. With most of the chemicals examined, it is true, no serious difficulty was experienced. A substance like phenacetin, for instance, having a definite chemical formula, crystalline in form, with a well-defined melting-point and characteristic reactions, gave us very little trouble, but it was by no means such clear sailing with less definite substances; and, thinking that, perhaps, you would find a hasty review of some of the articles which failed to pass the ordeal more interesting than those which did, we have brought a number of the latter, and will show them to you, with an explanation of the reasons for rejection in each case.

The Commissioner of Internal Revenue is inclined to hew pretty close to the line, and exempt no proprietary remedy under the proviso which is not clearly and fully entitled to it under the terms of the decision of the Court. This being the case, a rather rigid standard was adhered to, and quite a number of medicinal chemicals failed to answer its requirements.

Many preparations which are classed in the trade as synthetic remedies, and included in the lists given by Coblenz and Thoms, are very far from being definite bodies, pure and unmixed with any other substance whatever. *Ichthyol* and *Tumenol*, for example, are products obtained by treating mineral oil with sulphuric acid, whereby sulphones and sulphonic acids of the various unsaturated hydrocarbons present in the oil are produced. While both preparations contain sulphur in organic combination, and are doubtless valuable in medicine, they are mixtures, not only of the sulphones of different hydrocarbons, but even of the different classes of bodies, sulphones and sulphonic acids, as shown by the following figures, hence they are not definite bodies:

	Ichthyol. Per Cent.	Tumenol. Per Cent.
Loss at 100° C. . . . .	43.09	6.32
Ash . . . . .	0.03	9.28
Extracted by alcohol (sulphonic acids) . . . . .	50.21	46.09
Insoluble in alcohol (sulphones) . . . . .	6.30	38.31
 Totals . . . . .	 99.63	 100.00

Somewhat similar is the case of albuminoid or proteid bodies, and combinations of such bodies with different bases and acids. Hemol, hemogallol, ferratin, iron somatose, tannalbin, argonin, etc., are examples. Iron, for instance, enters into chemical combination

with proteid bodies, and the combinations formed are very stable ones; but that a preparation made by treating egg albumin with an iron salt produces a single definite chemical compound is altogether improbable. In fact, it is disproved by the very variable quantity of combined iron found in such preparations, as will be seen by the analyses which follow. No proteid bodies, therefore, have been exempted except one, protargol, this having been included with the articles passed upon in Justice Brown's decision.

	Per Cent.	Per Cent.
	Total Proteids N X 6.25	Iron Fe
Ferratin . . . . .	89.25	7.18
Iron somatose . . . . .	84.87	1.52
Hemol . . . . .	88.81	0.30
Hemogallol . . . . .	89.94	0.26

Some of the difficulties experienced in marking out the line of division between compounded and uncompounded chemicals may be illustrated by the two closely allied preparations called *creosotal* and *duotal*. The latter, being the carbonate of a single definite body, viz., guaiacol, is itself definite, having a crystalline structure and constant melting point. It is, therefore, a distinct chemical compound and entitled to exemption. Creosotal, on the other hand, is prepared by the action of phosgene gas upon beechwood creosote. It contains, therefore, carbonates of the various phenoloid bodies contained in creosote, consequently is a mixture of different substances in indefinite proportions, and *not* an uncompounded chemical.

*Pyoktanin blue* and *pyoktanin yellow* are two aniline dyes used in medicine. The yellow is exempt, being a single definite chemical compound; the blue is not, being a mixture of the hydrochlorides of penta and hexa methyl para rosaniline.

Two very interesting preparations used in latter-day medicine are colloidal silver and mercury, known under the trade names of *collargolum* and *hyrgolum*, respectively. In both preparations the intention has been to produce the metal in a colloidal state, the advantage for medicinal purposes being the solubility in water of metals in this condition. Colloidal silver or mercury would, of course, fully answer the requirements of the definition of a distinct chemical entity, being simple elements. Upon examination, however, the samples submitted were found to contain such considerable pro-

portions of other chemicals as impurities incident to the process of preparation, some of which have, moreover, decided therapeutic properties of their own, that they cannot possibly be considered as pure silver or mercury. As these preparations have considerable interest in themselves, and much attention has been paid in the journals recently to metals in the colloidal state, we give the results of analysis in full. A large percentage of the metals had reverted to the ordinary, or insoluble form. According to the latest theory in regard to colloidal metals they are in a state of emulsion, as it were, and the impurities are necessary to keep the minute particles of the metal in suspension.—(*Jour. Soc. Chem. Ind.*, 1899, 18-1129.)

## COLLARGOLUM.

	Per Cent.
Water (loss at 100° C.) . . . . .	2.32
Silver (Ag) . . . . .	84.05
Iron (Fe) . . . . .	1.39
Equivalent to ferrous tartrate . . . . .	5.06
Ammonia (NH <sub>3</sub> ) . . . . .	2.25
Equivalent to ammonium tartrate . . . . .	7.42
	98.85
Soluble in water . . . . .	25.28
Insoluble in water . . . . .	74.72
	100.00

## HYRGOLUM.

Mercury (Hg) . . . . .	70.47
Tin (Sn) . . . . .	8.60
Equivalent to colloidal stannic acid . . . . .	12.22
Ammonia (NH <sub>3</sub> ) . . . . .	3.22
Equivalent to ammonium citrate . . . . .	15.33
Water, etc. (by difference) . . . . .	1.98
	100.00

*Diuritin* represents a class of preparations in which the application of the usual test of a definite chemical formula would appear to entitle them to exemption. It is prepared by mixing solutions of the sodium salt of theobromine and sodium salicylate in the proper molecular proportions to form a double salt, and evaporating to dryness. The manufacturers claim that a definite compound is produced, but the combination, if any, is a very weak one. The presence of free theobromine is also shown by its extraction with a solvent.

Similar preparations are Urophenin S and Urophenin B, the analyses of which follow. We think chemists will agree with us in considering such preparations as mixtures.

## DIURETIN.

	Per Cent.
Water (loss at 50° C.) . . . . .	0'85
Sodium theobromate . . . . .	53'40
" salicylate . . . . .	42'30
Extracted by chloroform . . . . .	2'13
	98'68

## UROPHERIN S.

	Per Cent.
Water (loss at 50° C.) . . . . .	0'93
Lithium theobromate . . . . .	54'23
" salicylate . . . . .	41'99
Theobromine extracted by chloroform . . . . .	1'87
	99'02

## UROPHERIN B.

	Per Cent.
Water (loss at 50° C.) . . . . .	0'25
Lithium theobromate . . . . .	56'53
" benzoate . . . . .	38'45
Theobromine extracted by chloroform . . . . .	2'34
	97'62

The remaining preparations which we will bring to your attention are of the nature of "frauds" of variable dimensions, and indicate that charlatanism in medicine is not entirely confined to the remedies sold to the general public. They are offered for sale to the medical profession only, purport to be of definite composition—a formula being given in some cases—and are provided with a trademark name suggestive of either pathologic conditions or chemical components, after the manner of synthetic remedies. Acetanilid seems to be a favorite ingredient, appearing in preparations intended for topical use, as well as in those recommended for internal administration as antipyretics.

*Phenalgin* is a preparation which is described on the label as "phospho-ammonio-phenylacetamide." It is the ordinary type of "headache powder," as will be seen by the analysis:

	Per Cent.
Acetanilid . . . . .	67'38
Sodium bicarbonate . . . . .	28'20
" carbonate . . . . .	1'34
Ammonium carbonate . . . . .	0'80
Moisture (by difference) . . . . .	2'28
	100'00

*Febrinol* is a preparation of very similar composition, although it is held out to the profession as "methyl-para-acet-phenetidin." There is a compound corresponding to this designation, listed by Coblenz as methyl phenacetin, and stated to have hypnotic properties. It is not known to us, but is stated to have a melting point of 40° C., while the crystalline substance extracted by ether from febrinol melts at 112° C., and is, in fact, acetanilid. Following is the complete analysis of febrinol:

	Per Cent.
Acetanilid . . . . .	49.79
Sodium bicarbonate . . . . .	34.28
"    carbonate . . . . .	4.03
Sugar . . . . .	11.59
	99.69

*Puronal* is held out as a valuable remedy for external use on ulcers, etc., and internally in fermentative conditions of the alimentary canal. It is described on the label as "The tetra methylate of phenol, iodine and bismuth." Analysis gave the following results:

	Per Cent.
Acetanilid . . . . .	97.22
Bismuth oxyiodide . . . . .	2.35
	99.57

*Phocene* is described in literature accompanying it as "sulpho-metadihydroxy benzene," with the formula  $C_6H_4(OH)_2SO_4$ . Its composition is as follows:

	Per Cent.
Resorcinol — $C_6H_4(OH)_2$ . . . . .	81.30
Zinc sulphocarbolate . . . . .	18.45
	99.75

*Iatrol* is a preparation held out as a substitute for iodoform. It is described by Coblenz as "oxy-iodo-methyl-anilid, obtained by the action of iodine on an aniline derivative." Thoms gives it the same designation, but says that little is known of the details of its preparation. Both authors must have accepted the statements of the manufacturers as to its composition, for no such constitution can be made out from the sample we examined. It has a melting point of 112° C., and gives all the reactions of acetanilid. The percentage of nitrogen is 10.23, corresponding to 98.65 per cent. acetanilid. On shaking with carbon disulphide, a slight trace of iodine was obtained, which may come from a minute addition of aristol, as it seems to have the faint odor of that substance.

## CROCUS AND SOME OF ITS ADULTERANTS.

BY WILLIAM STAIR WEAKLEY.

The following studies were carried out in the Botanical Laboratory of the Philadelphia College of Pharmacy at the suggestion of Professor Henry Kraemer, and to whom I am indebted for suggestions in regard to the work. The studies are based upon natural specimens of *Crocus sativus*, L., grown in Lancaster County, Pa., which were furnished by Mr. Joseph L. Lemberger, of Lebanon; and upon herbarium specimens of *Calendula officinalis*, L., and *Carthamus tinctorius*, L., in the Martindale Herbarium of the Philadelphia College of Pharmacy.

*Crocus Sativus*, Linné.—The two parts of the illustration, as given in Plate I, represent a longitudinal section of the plant, so as to show more fully its internal structure from roots to stigma.

In the plant we find the roots originating in the lower half of the corm and penetrating through its tissues and passing into the soil (see 8). Around the epidermis of the living corm are found numerous brownish-colored layers with fine longitudinal fibres. These layers represent the remains of previous years' growth (see 7). The leaves arise at the apex near the centre of the corm, are nearly erect and surrounded by a sheath of membranous scales. These leaves vary in number from six to nine, are 4-5 inches long, linear, acute, entire, stiff, curved outwards, smooth, shining, deep green, with a white depressed midrib; sessile and form an erect tuft which is closely invested in its lower part by four or five large, broad, thin, tough, membranous, sheathing scales.

The flowers may be either solitary or two together, and are borne on an erect short scape from a leaf axil, closely enveloped by a delicate membranous sheath which is trifid at the apex, presenting a somewhat serrate appearance, and it being delicately veined and united near its base.

The stamens are three in number and are inserted in the mouth of the tube opposite the outer segments; the anthers are linear, longer than the filaments, sagittate at the base, blunt at apex (see 4) and of a bright orange-yellow color. It may be noted that Carson, in his Medical Botany, figures the innate anthers as having an acute apex. On the contrary, they are blunt with somewhat rounded edges.

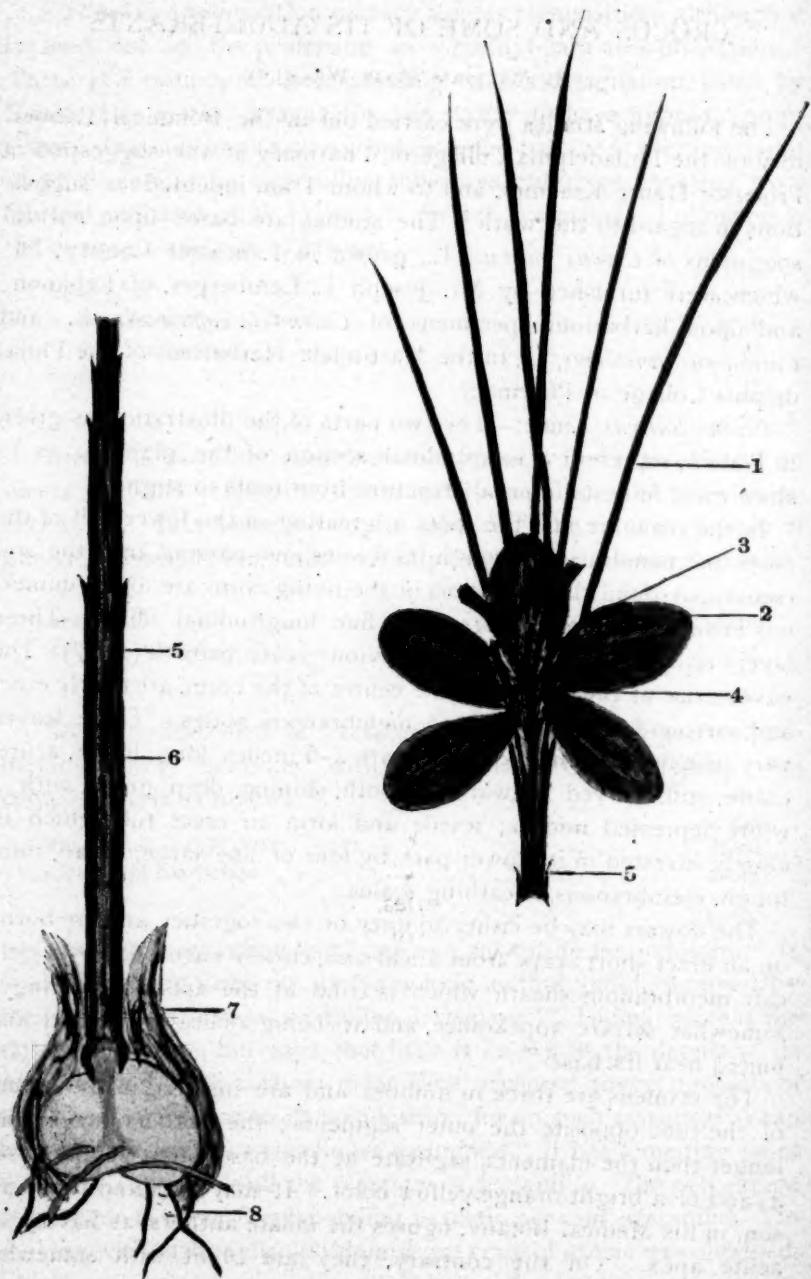


PLATE I.—Longitudinal section through the entire plant of *Crocus sativus*, L.

The style is long and slender, and at about the level of the base of the anthers it bears the three parted stigmas (see 3), each of which is tubular, dilated, often notched along one side and of an orange-carmine color.

The principal characteristics distinguishing crocus, calendula and carthamus have already been given in a paper by Henry Kraemer (*Proc. Penn. Pharm. Assoc.*, 1898; also this JOURNAL, 1898, p. 386). Drawings of these characteristics are given in Plate II. These drugs, when pure and placed under the microscope, may be recognized by their color alone, but when adulterated a careful microscopical examination is necessary.

The group of figures under A represent the chief characteristics of powdered crocus, in which is shown the papillæ present on the apex of the stigma, together with the pollen grains, which are few in number, scattered throughout the field; they possess numerous fine prickles, and have a diameter of 98.175 mikrons, with a wall 4.462 mikrons thick, there being found a few with abnormally large prickles. A grain is also shown just prior to the germination of the pollen tubes, the number of projections found in eight mounts never exceeded two, which was found in but one instance, and but few were found having one tube formed, the remaining ones being characterized by freedom from exuding tubes, and in possessing a spherical shape; not infrequently do we find small yellow oil globules adhering to these grains. There is also herein shown the dotted and striated appearance of the cells of a fragment of the anther.

The figures in the group B represent the chief characteristics of powdered calendula, in which is shown elongated cells having a wavy cell wall, in the cells of which are found yellowish oil globules.

The pollen grains in this drug are somewhat more numerous than in crocus, and differ quite widely as to their spinose character, the long pointed spines systematically alternate with each other when focused upon, and measure 3.57 mikrons. The grains have a diameter of 32.13 mikrons, with a wall of 3.57 mikrons. A grain in process of germination is also shown, which is characterized in being triangular in outline, and having three points of egress for the germinating grain.

The chief characteristics present in powdered carthamus, as shown by the figures in group C, are the sienna-brown laticiferous

vessels running lengthwise throughout portions of the flower, between which are found the spiral ducts, the whole being surrounded by numerous, matted, one-celled, colorless hairs.

The shape of the pollen grains, some of which are elliptical, together with the large number of grains present in this powder,

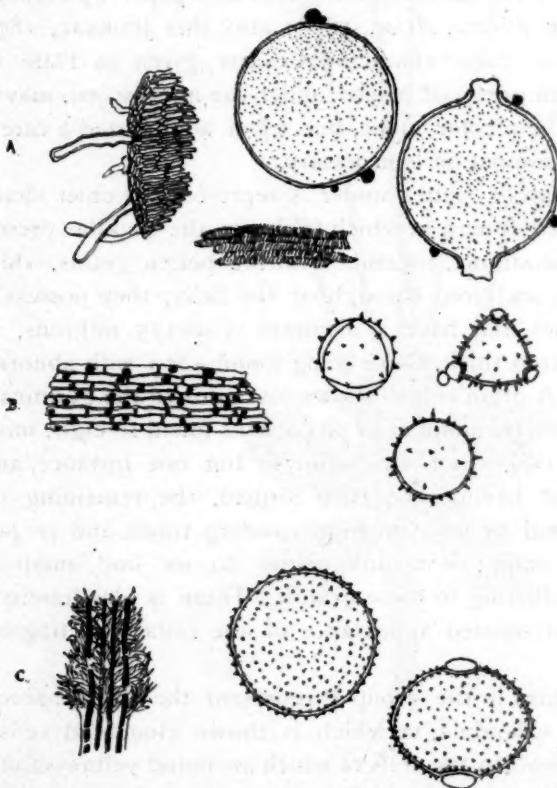


PLATE II.—*A*, Fragments of stigma and anther and pollen grains of *Crocus sativus*, L.; *B*, fragment of corolla and several pollen grains of *Calendula officinalis*, L.; *C*, fragment of corolla and some pollen grains of *Carthamus tinctorius*, L.

forms a very striking characteristic; they possess spines somewhat shorter than those of calendula, but more numerous; also differing from those of the latter in that their method of arrangement is scattered, these spines measuring 2.38 mikrons, the grain having a diameter of 60.69 mikrons, with a wall of 3.57 mikrons.

## VALUATION OF CROCUS.

The object of this part of the investigation was to ascertain the degree of purity that can be met in good commercial saffron. It was considered that the U.S.P. definition, requiring the drug to consist of stigmas only, was too stringent and not practicable, as the style and other parts of the flower were likely to be present, not intentionally, but rather by reason of difficulty in collecting stigmas only.

The micro-chemical valuation, as suggested by Professor Kraemer, was carried out in the following manner: From six or eight different parts of the sample were taken small portions of the drug (about 5 grammes), these were then mixed, after which 100 pieces were counted out at random to be tested; a suitable number of these pieces were then laid upon a slide and sulphuric acid C.P. added, those giving the characteristic blue color reaction noted, the number of which is compared to those giving other than a blue coloration, and the percentage of adulteration estimated.

In the examination of twelve commercial specimens by the above test, the following results were noted:

	Blue with Sulphuric Acid.	Coloration other than Blue.
1	90	10
2	68	32
3	86	14
4	78	22
5	82	18
6	74	26
7	88	12
8	48	52
9	46	54
10	spurious.	
11	"	
12	carthamus.	

The results thus obtained indicate that the purest samples of crocus upon the market are but 90 per cent. pure; *i. e.*, contain but 90 per cent. stigmas, as required by the U.S.P.

Two other samples obtained from different sections of Lancaster County were absolutely pure and free from any admixture, either mineral or organic.

The materials present in the first seven samples examined were, besides stigmas, fragments of yellow anthers and styles.

No. 8, labelled Alicanth saffron, was found to be adulterated with some portion of another plant, together with quite an appreciable quantity of adhering barium sulphate. The coloring matter present dissolved with a red color in sulphuric acid.

No. 9.—The adulteration here present turned brown with sulphuric acid and contained a coloring matter soluble in dilute alcohol, imparting to this solvent a magenta color. The pollen grains present measured 99.96 mikrons in diameter, having a wall of 7.14 mikrons in thickness and finely spinose, the chromoplastids ranging from 1.19-1.47 mikrons in diameter. The pollen grains were colored purplish-red, a portion of the coloring matter having been absorbed, which thus gave conclusive evidence of a prepared and intentional adulteration.

No. 10.—This sample was labelled German saffron, and possessed a somewhat tea-like odor, with a brownish-red coloring matter soluble in dilute alcohol.

The few pollen grains which were present had a diameter of 39.27 mikrons, possessing numerous spines 7.14 mikrons long and a wall of 2.38 mikrons.

Upon the addition of sulphuric acid to this sample it gradually turned a seal-brown.

No. 11.—This sample presented in bulk about the same appearance as the previous sample, although in detail it differed from the former in that the pollen grains were absent, and with sulphuric acid it turned brownish-black, gradually becoming darker and disintegrating with slight pressure. The coloring matter present was insoluble in dilute alcohol.

In order to determine the coloring matter present in the adulterants of these samples, the tests given in Prescott's and in Allen's works on Organic Analysis were applied, but without success, not even a clue being found as to their identification. The failure at this point seemed to be due to the presence of the natural color in the undyed petal or a mixture of dye colors was used, thus vitiating the results.

In the case of No. 12, Spanish saffron was ordered and carthamus received instead.

Some possible adulterations of crocus were considered in the course of the work. The pollen grains with measurements, together with those of the chromoplastids and average size of petal are given.

All of these adulterations belong to the compositæ, two being cultivated varieties of chrysanthemum, and hence those most liable to be used by the dealer in trying to imitate the true drug by coloring matter and other available means.

Yellow chrysanthemum: Petal,  $30 \times 7$  millimetres; pollen grains, 42.84 mikrons in diameter, with adhering oil globules; wall, 1.785 mikrons; spines, 1.785 mikrons, and chromoplastids, 2.677 mikrons.

Scarlet chrysanthemums: Petal,  $32 \times 5$  millimetres; pollen grains, absent, and chromoplastids, 2.677 mikrons.

Sunflower: Petals,  $40 \times 10$  millimetres; pollen grains, 32.13 mikrons in diameter; wall, 2.677 mikrons; spines, 4.462 mikrons, and chromoplastids, 3.57 to 4.462 mikrons.

### SOLUBLE FERRIC PYROPHOSPHATE.

BY W. E. RIDENOUR.

Research Committee E, Pharmacopœia Revision.

The investigation herein presented was suggested by the statement of a very large pharmaceutical manufacturing firm, that no "Iron Pyrophosphate, Soluble," on the market would answer the U.S.P. requirements, especially in regard to the absence of orthophosphate.

A few years ago Dr. Julius Stieglitz<sup>1</sup> gave a very exhaustive paper on a method for distinguishing orthophosphoric acid from pyrophosphoric acid by the use of magnesium sulphate and acetic acid. In this connection the author mentioned that the soluble pyrophosphate of iron as found on the market varied to a marked degree, some of the samples examined containing only a trace of orthophosphate, while others showed the absence of any pyrophosphate; and in view of these results, asked the interesting question as to whether soluble pyrophosphate of iron reverts during the process of manufacture.

In 1892 F. A. Thompson<sup>2</sup> reported the examination of several samples of soluble pyrophosphate of iron according to the directions of the U.S.P., with the result that all contained orthophosphate.

J. B. Naglevoort<sup>3</sup> favored Fresenius' method for the detection of

<sup>1</sup> AM. JOUR. PHARM., 1891, 585-593.

<sup>2</sup> Proc. Am. Ph. Assoc., 1892, 259.

<sup>3</sup> AM. JOUR. PHARM., 1895, 210.

orthophosphate in pyrophosphate, using limited quantities of magnesium sulphate and ammonium chloride.

With the above data before me, I collected a number of samples of iron pyrophosphate, soluble, taking only those for examination which could be secured in the original package. Seven samples were thus obtained and tested for orthophosphate according to the method of the U.S.P., which is as follows:

If 1 gramme of the salt be boiled with 10 c.c. of potassium or sodium hydrate, T. S., a reddish-brown precipitate will be produced, and if the colorless filtrate from this precipitate be strongly acidulated with hydrochloric acid, then magnesia mixture added, and subsequently a slight excess of ammonia water, no precipitate should be produced (distinction from and absence of ferric phosphate).

According to the above test, all the samples gave heavy precipitates, indicating, apparently, the presence of orthophosphate.

I here wish to call attention to a result of the examination, which developed while making the above tests. Samples Nos. 1, 4, 5 and 7 evolved a very strong odor of ammonia when treated with sodium or potassium hydrate, T. S., which indicates that the manufacturers from whom these samples were obtained are not making "Ferri Pyrophosphas Solubilis" according to the U.S.P., 1890, but for some reason are following a process official in the U.S.P., 1860 and 1870; according to which sodium phosphate was converted into the pyrophosphate, by moderately igniting it. This was then dissolved in water and mixed with a diluted solution of tersulphate of iron, when ferric pyrophosphate was precipitated. The precipitate was washed with cold water and dissolved in a solution of citrate of ammonium.

A sample of iron pyrophosphate was now prepared according to the directions of the U.S.P., 1890; the sodium pyrophosphate, prepared by myself, was free from orthophosphate by the ammonium molybdate test, as was also the finished iron salt. However, this product would not stand the U.S.P. test.

Here, apparently, was some discrepancy, and an effort was made to overcome the difficulty. The U.S.P. procedure was now modified by using varying proportions of magnesia mixture, but the results were unsatisfactory. Even sodium pyrophosphate, free from orthophosphate, by the ammonium molybdate test, indicated the presence of the latter by the magnesia mixture. This test was

therefore abandoned. In this connection I wish to call attention to an observation which I have not heretofore seen recorded, which is that magnesium phosphate and ammonium magnesium phosphate, freshly precipitated, are completely soluble in sodium pyrophosphate in large excess, and are not reprecipitated by ammonia, but by excess of the magnesium salt.

The following test, which is a slight modification of the one proposed by Stieglitz, was finally adopted as being most satisfactory. Very accurate results may be obtained with it by moderate care, and for this reason I recommend it to the notice of the Committee of Revision of our next Pharmacopoeia.

Boil 1 gramme of the salt with 10 c.c. of potassium or sodium hydrate, T. S., to remove the iron. Filter, acidulate the colorless filtrate with hydrochloric acid, and add a slight excess of ammonia water and a solution of magnesium sulphate<sup>1</sup> so long as a precipitate is formed; slightly acidulate with acetic acid, boil and filter. The filtrate should give no precipitate upon adding ammonia water in slight excess.

The following results were obtained with the above test upon the samples collected :

No.	Author's Test for Orthophosphate.	Proved by Ammonium Molybdate Test.	Proved by Silver Nitrate.
1 . . . . .	Heavy precipitate	Heavy precipitate	Yellow precipitate
2 . . . . .	Very heavy precipitate	Very heavy precipitate	" "
3 . . . . .	Small "	Small "	" "
4 . . . . .	Heavy "	Heavy "	" "
5 . . . . .	Very heavy "	Very heavy "	" "
6 . . . . .	" "	" "	" "
7 . . . . .	Small "	Small "	" "
8 . . . . .	—	—	—
9 . . . . .	—	—	—

No. 8 was prepared by the author. No. 9 was handed the author by a fellow-chemist, and guaranteed to be free from orthophosphate.

It is thus proved that iron pyrophosphate soluble does not revert

<sup>1</sup> Magnesium sulphate, 10 grammes; ammonium chloride, 20 grammes, and water a sufficient quantity to make 120 c.c.

during the process of manufacture, and that the presence of orthophosphate is due to the carelessness of the operator in the making of the pyrophosphate of sodium.

Only two of the above samples claimed to be U.S.P. on the label, these being Nos. 2 and 6.

For examining iron phosphate soluble, the directions should read:

If 1 gramme of the salt be boiled with 10 c.c. of potassium or sodium hydrate, T.S., a reddish-brown precipitate will be produced, and, if the colorless filtrate from this precipitate be acidulated with hydrochloric acid, then a slight excess of ammonia water added, and a solution of magnesium sulphate (magnesium sulphate, 10 grammes; ammonium chloride, 20 grammes; water, a sufficient quantity to make 120 c.c.) added so long as a precipitate is formed, this precipitate should be completely soluble in acetic acid, added in slight excess, and not reprecipitated upon boiling.

### FLORA FILIPPINENSIS.<sup>1</sup>

In the Free Library of Philadelphia (Chestnut, above Twelfth), I found the celebrated *Flora Filippinensis*, by Blanco, Mercado and Llanos, edited by Naves and Villar, Manila, 1877-1880, in two big folios plates, and four folios text.

This flora will be found on the top floor, where the other rare and costly works are kept.

I give in the following a synopsis of contents (merely number of species in each family), which may come handy. The plates are fully the equal of any I have seen (colored), but not exactly arranged properly, and not provided with numbers.

- |                       |                         |
|-----------------------|-------------------------|
| 1. Dilleniaceæ (3),   | 9. Pittosporaceæ (1),   |
| 2. Magnoliaceæ (3),   | 10. Caryophyllaceæ (1), |
| 3. Anonaceæ (8),      | 11. Portulacæ (1),      |
| 4. Menispermaceæ (1), | 12. Hypericinæ (2),     |
| 5. Nymphaceæ (1),     | 13. Guttiferæ (2),      |
| 6. Papaveraceæ (1),   | 14. Dipterocarpeæ (3),  |
| 7. Capparideæ (7),    | 15. Malvaceæ (18),      |
| 8. Bixineæ (3),       | 16. Sterculiaceæ (13),  |

<sup>1</sup> The above information was communicated by Mr. Hans M. Wilder to the editor, and it was thought that it might be useful to others.

17. Tiliaceæ (4),  
 18. Malpighiaceæ (1),  
 19. Geraniaceæ (3),  
 20. Rutaceæ (7),  
 21. Simarubeæ (1),  
 22. Burseraceæ (1),  
 23. Meliaceæ (6),  
 24. Olacineæ (1) (what is that?),  
 25. Celastrineæ (1),  
 26. Rhamneæ (2),  
 27. Ampelideæ (5),  
 28. Sapindaceæ (3),  
 29. Anacardiaceæ (5),  
 30. Moringæ (1),  
 31. Connaraceæ (1),  
 32. Leguminosæ (66),  
 33. Rosaceæ (2),  
 34. Crassulaceæ (2),  
 35. Rhizophoreæ (4),  
 36. Combretaceæ (4),  
 37. Myrtaceæ (8),  
 38. Melastomaceæ (3),  
 39. Lythrarieæ (5),  
 40. Onagrarieæ (1),  
 41. Samidaceæ (2),  
 42. Passifloræ (1),  
 43. Cucurbitageæ (10),  
 44. Begoniaceæ (1),  
 45. Cacteæ (1),  
 46. Ficoidæ (1),  
 47. Araliaceæ (1),  
 48. Rubiaceæ (17),  
 49. Compositæ (10),  
 50. Goodenoviae (1),  
 51. Campanulaceæ (1),  
 52. Plumbagineæ (1),  
 53. Myrsinea (3),  
 54. Sapotaceæ (4),  
 55. Ebenaceæ (2),  
 56. Oleaceæ (2),  
 57. Apocynaceæ (14),  
 Total, 483 plates.
58. Asclepiadaceæ (8),  
 59. Gentianæ (1),  
 60. Borraginæ (6),  
 61. Convolvulaceæ (13),  
 62. Solanaceæ (11),  
 63. Scrophularieæ (6),  
 64. Bignoniacæ (4),  
 65. Pedalineæ (1),  
 66. Acanthaceæ (10),  
 67. Verbenaceæ (15),  
 68. Labiatæ (8),  
 69. Plantagineæ (1),  
 70. Nyctagineæ (3),  
 71. Amaranthaceæ (7),  
 72. Chenopodiaceæ (2),  
 73. Polygonaceæ (1),  
 74. Aristolochieæ (1),  
 75. Piperaceæ (3),  
 76. Laurineæ (2),  
 77. Loranthaceæ (2),  
 78. Santalaceæ (1),  
 79. Euphorbiaceæ (22),  
 80. Urticaceæ (15),  
 81. Juglandeæ (1),  
 82. Cupuliferae (2),  
 83. Coniferæ (1),  
 84. Scitamineæ (11),  
 85. Orchideæ (7),  
 86. Iridæ (2),  
 87. Amaryllideæ (8),  
 88. Bromeliaceæ (1),  
 89. Liliaceæ (4),  
 90. Pontederaceæ (1),  
 91. Commelinaceæ (4),  
 92. Palmae (5),  
 93. Pandaneæ (3),  
 94. Aroideæ (4),  
 95. Cyperaceæ (1),  
 96. Gramineæ (7),  
 97. Filices (1),

ALL OXYMETHYLANTHRAQUINONES possess purgative properties, and Tschirch (*Arch. der Pharm.*, 1899, p. 632) suggests that they may well replace the natural drugs containing them, as rhubarb, etc. The trioxy-compounds (as emodin) are more powerful than the dioxy-compounds (as chrysophanic acid).

## RECENT LITERATURE RELATING TO PHARMACY.

## PERSIAN TOBACCO.

The Persians smoke a species of *Nicotiana*—probably *N. Persica*—which they call *tumbac*. M. R. Georgiades (*Bull. Soc. Phar. de Bordeaux*, 1899, 179) discusses this plant and its uses, referring to the native method of curing and the smoking of same through the *narghileh*—the oriental water pipe. The writer, desiring to know if the use of this species of wash bottle lessened the probability of absorption of nicotine by the smoker, estimated the alkaloid in the dry tobacco, in the wash liquor of the pipe, which is called the *nafas*, and lastly in the inhaled smoke, running the latter into a wash bottle containing water.

Assayed by the method of Schloesing, each 18 grammes of tobacco (a pipeful) showed 0.947 gramme nicotine, the *nafas* through which this quantity of tobacco was smoked showed 0.595 gramme nicotine, while the washed smoke from same amount contained but 0.0225 gramme.

The figures are of course approximate, but they show the value of such forms of nicotine absorbers.

The article contains analyses of moisture and salts in the *tumbac*—results similar to those from American tobacco.

H. V. ARNY.

## A NEW REAGENT FOR MORPHINE.

Professor R. Kobert reports (*Ztschrft. Oest. Ap. Ver eins*, 1899, 368) on the value of formalin—sulphuric acid (made by adding 2 or 3 drops formalin solution—40 per cent.?—to 3 c.c. concentrated sulphuric acid)—as a watch-crystal color reagent for morphine and its derivatives. It colors morphine purple-red, then violet, then blue-violet, and finally pure blue. The solution gives an absorption spectrum from which the orange and yellow is extinguished.

The report gives the color modifications when dionine, codeine, heroine and peronine are employed. It is interesting that the reagent colors methylphen-morpholin a deep red. This substance has no medical properties in common with morphine, but is a decomposition product of same and an agent in synthesis of the alkaloid.

H. V. A.

## PHILADELPHIA HOSPITAL FORMULARY.

Under the name *Pharmacopœia of the Philadelphia Hospital*, the formulæ used in the Philadelphia Hospital have been published in 1875, 1882 and 1888. The old title has been replaced by the above title. The present "Formulary" contains a revision of many of the original formulæ, as well as new formulæ of the newer remedies.

## ELIXIRIA.

*Elixir Acetanilidi.*

Each teaspoonful contains :

Acetanilide . . . . .	2·5 gr.	0·15 gm.
Spt. Ammon. Aromatic . . . . .	15 m.	1 c.c.
Tr. Card. Comp. . . . .	15 m.	1 c.c.
Alcohol . . . . .	15 m.	1 c.c.
Elixir, Orange, to measure . . . . .	1 fl. dr.	4 c.c.

Dose : One teaspoonful.

*Elixir Ferri, Quininae et Strychninæ.*

Each teaspoonful contains :

Iron Pyrophos . . . . .	2 gr.	0·13 gm.
Quinine Hydrochlor. . . . .	1 gr.	0·065 gm.
Strychnine Sulphate . . . . .	1/4 gr.	0·001 gm.
Glycerin . . . . .	10 m.	0·6 c.c.
Syrup . . . . .	20 m.	1·2 c.c.
Elixir, Orange, to measure . . . . .	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

*Elixir Glonoini.*

Each teaspoonful contains :

Solution, Nitroglycerin (1 per cent.) 1 m. = 1/10 gr.		
of Nitroglycerin . . . . .	1 m.	0·06 c.c.
Elixir, Orange, to measure . . . . .	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

*Elixir Potassii Arsenitis.*

Each teaspoonful contains :

Sol. Potass. Arsenite, 2 m. = 1/10 gr. of Arsenious Acid, with Potassium Bicarbonate . . . . .	2 m.	0·12 c.c.
Tr. Card. Comp. . . . .	5 m.	0·3 c.c.
Elixir, Orange, to measure . . . . .	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

*Elixir Strychninae Arsenatis.*

Each teaspoonful contains :

Strychnine Arsenate . . . . .	1/2 gr.	0·001 gm.
Elixir, Orange, to measure . . . . .	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

**EMULSA.***Emulsum Olei Gaultheriae.*

Each teaspoonful contains:

Oil, Wintergreen . . . . .	15 m.	1 c.c.
Acacia,		
Sugar, of each, sufficient.		
Water, to measure . . . . .	1 fl. dr.	4 c.c.

Dose: One-half to one teaspoonful.

*Emulsum Olei Morrhuae.*

Each tablespoonful contains:

Oil, Cod Liver . . . . .	2 fl. dr.	8 c.c.
Oil, Wintergreen,		
Oil, Sassafras,		
Acacia,		
Sugar, of each, sufficient.		
Water, to measure . . . . .	4 fl. dr.	15 c.c.

*Emulsum Olei Morrhuae Cum Hypophos.*

Each tablespoonful contains:

Oil, Cod Liver . . . . .	1.5 fl. dr.	6 c.c.
Oil, Wintergreen,		
Oil, Sassafras,		
Acacia, of each, sufficient.		
Syrup, Hypophos. . . . .	1 fl. dr.	4 c.c.
Water, to measure . . . . .	4 fl. dr.	15 c.c.

Dose: Tablespoonful.

*Emulsum Olei Morrhuae Cum Hypophos, Creosot.*

Each tablespoonful contains:

Creosote . . . . .	2 m.	0.12 c.c.
Emulsion, Cod Liver Oil and Hypophosphite, to measure . . . . .	4 fl. dr.	15 c.c.

Dose: Tablespoonful.

*Emulsum Olei Morrhuae Cum Lactophos.*

Each tablespoonful contains:

Oil, Cod Liver . . . . .	1.5 fl. dr.	6 c.c.
Oil, Wintergreen,		
Oil, Sassafras,		
Acacia, of each, sufficient.		
Syr. Calcium Lactophos. . . . .	1 fl. dr.	4 c.c.
Water, to measure . . . . .	4 fl. dr.	15 c.c.

Dose: Tablespoonful.

*Emulsum Olei Terebinthinae.*

Each teaspoonful contains:

Oil, Turpentine . . . . .	5 m.	0.3 c.c.
Acacia,		
Sugar, of each, sufficient.		
Water, to measure . . . . .	1 fl. dr.	4 c.c.

Dose: One to two teaspoonfuls.

*Emulsum Terebeni.*

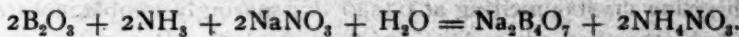
Each teaspoonful contains :

Terebene . . . . .	3 m.	0·18 c.c.
Acacia,		
Sugar, of each, sufficient.		
Water, to measure . . . . .	1 fl. dr.	4 c.c.

Dose : One to two teaspoonfuls.

**MANUFACTURE OF BORAX.**

Boric acid, ammonia and sodium nitrate are mixed in the proportion indicated by the following equation :



Just sufficient water is added to dissolve the ingredients. The chemical reactions produce enough heat to warm the solution, which, on cooling, deposits crystals of borax. These are separated from the ammonium nitrate solution by means of a centrifugal machine.—Eng. Pat., No. 862, January 13, 1899. L. F. K.

**ITALIAN BEESWAX.**

A. Funaro gives the following constants for pure beeswax: Specific gravity, 0·961-0·964; melting-point, 63-64·4° C.; acid number, 21-22; saponification number, 91-96; index of refraction, 42-45°.—*L'Oroso*, 22, 109. L. F. K.

**SODIUM HYPOCHLORITE CRYSTALS.**

To obtain these, a solution containing about 400 grammes of available chlorine per litre is subjected to a low temperature, when a considerable deposit of crystals will take place.—Eng. Pat., No. 25,925, December 8, 1898. L. F. K.

**A NEW INDICATOR.**

A. E. Sunderland and A. E. Rhodes (*J. Soc. Dyers and Colorists*, 1899, 15, 206) recommend the diazo compound of para-nitranilide and propylmetacresol as an indicator in alkaline and acid work. It is a powder insoluble in water, but soluble in water containing 30 or more per cent. of alcohol. It can replace lacmoid in estimating the hardness of water; is more sensitive than phenolphthalein, is serviceable for organic acids and equal to methyl orange for estimating ammonia. It is, however, sensitive to carbonic acid and

the carbonates. It is said to surpass other indicators in sensibility and sharpness of end reaction. The color reaction is pink when alkaline and faint yellowish in an acid medium. L. F. K.

"PEREZOL," A NEW INDICATOR.

Under the above name, Duyk describes a new indicator, which is derived from the rhizomes of a Mexican plant, *Perezia adnata*, by means of benzene or toluene. The proximate principle, pipitzaoic acid, obtained by evaporating the above solvents from the extractive to crystallization and recrystallizing from the same, is a reddish-yellow crystal, melting at 67-70° C., sparingly soluble in water, alcohol, ether and oils. A  $\frac{1}{2}$  per cent. alcoholic solution is recommended. It is extremely sensitive to both fixed and volatile alkalies, and the end reaction is very sharp, even when highly diluted. Distilled water boiled in glass will give a distinct reaction. Alkaloids react with great delicacy with perezol, making it a valuable indicator for estimating these bodies volumetrically. Carbonic acid and organic acids deport themselves like mineral acids. Boric acid, however, acts like a base towards this indicator. Borates, acetates, carbonates and bicarbonates have an alkaline reaction, but the ammonia salts react neutral.—*Ann. de Chim. Analyt.*, 4, 372.

L. F. K.

A NEW SOURCE OF PILOCARPINE.

Rocher describes a new jaborandi *Pilocarpus racemosus*, indigenous in the French Antilles. The leaves contain about 1 per cent. of total alkaloids, of which 0.6 per cent. is pilocarpine and the remainder jaborine. The leaves also contain a greenish, very aromatic essential oil.—*Rep. de Pharm.*, 1899 (3), 11, 439.

L. F. K.

MANUFACTURE OF BARYTA.

H. H. Lake intimately mixes finely-powdered barium carbonate with about 8 per cent. of carbon, and places the mixture into a crucible lined with some vegetable fibre, like cardboard, which is also used to cover the same. The lid is luted down with earth, and the whole heated to 1,100° to 1,200° C. for ten hours. The evolving gases prevent ingress of air, which is essential. About 99 per cent. of the barium carbonate is transformed into the anhydrous baryta, from which the hydrate is easily obtained.—*Eng. Pat.*, No. 25,027, November 26, 1898.

L. F. K.

## EDITORIAL.

### THE OLD AND THE NEW PHARMACY.

If one takes the pains to compare the Proceedings of the American Pharmaceutical Association of recent years with those of twenty or twenty-five years ago, it is very apparent that the problems and affairs pertaining to pharmacy now are very different from what they were then.

The problems of a quasi-business character or those pertaining to the shop have been almost entirely replaced by more or less scientific investigations. We find that the collecting and preserving of drugs were then frequent subjects of papers; the Committee on Drug Markets, Adulterations and Sophistications of Drugs presented painstaking and valuable reports; graduated measures and general apparatus for chemical and pharmaceutical uses were chosen as themes for articles; the labelling of shop furniture, stock bottles and vials was a subject that was given closest attention; the devising of formulæ, with criticisms on the same, as well as useful notes on the Pharmacopœia and exhibitions of specimens, also tended to make the meetings peculiarly valuable to the retail pharmacist. If we look carefully into all of these contributions we find that it was the teachers and those closely allied with pharmaceutical colleges who were giving their best energies and unselfish labors for the benefit of the pharmacist. Since those days gradual changes have been taking place in pharmacy and necessarily in the character of the contents of the Proceedings of the American Pharmaceutical Association. Marked changes may be said to date, however, from the formation in the Association of the various sections on science, education, etc.

About this time a marked division of labor or specialization was developed, the manufacturers took up the problems relating to the furnishings and equipment of the pharmacy, and while one has supplied shop furniture, another has made a specialty of glassware, etc. At the same time the retail pharmacist has been supplied with drugs and preparations the purity of which was guaranteed by tests, etc., that he, for economic reasons, apparently could not well apply. The result has been that little by little the modern pharmacy has been converted in many instances into a shop in which some one else's preparations, be they patent or pharmacopœial, may be purchased. While the pharmacist is apparently not as independent as he was

some years ago, nevertheless it is evident, as indicated in the report of the Chairman of the Committee on Practical Pharmacy and Dispensing of the A.Ph.A. at the last meeting, that not only an equal degree of knowledge is required in the compounding of galenicals, but even a more intimate knowledge of the subjects involved, or, in other words, greater professional skill. When we consider what analytical and synthetical chemistry have given us in the nature of alkaloids, essential oils and new remedies, and when we look at the array of elegant, tasteless and at the same time efficient preparations furnished by galenical pharmacy, it is apparent that the pharmacist is no longer concerned in merely dispensing the more or less crude products of the vegetable and mineral kingdoms, but rather in dealing with those that are the products of the brain and skill of those engaged in the application of the sciences to modern pharmacy.

If no one scientist is master of even a very small part of a division of science, how little hope is there for a pharmacist of to-day to become a master of the different sciences the results of which are employed in the manufacture of the medicaments of to-day, and when we consider the number of experts who are engaged in devising new furniture, new apparatus, new preparations and medicaments involving a knowledge of the different departments of science, we expect the practical pharmacy and dispensing of to-day to be different from what they were some years ago.

Formerly the professor was intimately associated with the retail pharmacist and not infrequently had at least an interest in a retail store. In his work of instructing the students at college he collaborated the results of his own experience and those of others; he also instituted experiments and encouraged others in investigations relating to pharmacy. The teacher is now more concerned in expounding the principles and theories of the sciences than in working out the minor problems which his students and the pharmacists with their advanced training may and ought to do for themselves. At the same time the results of the investigations of the professor, as shown in the Proceedings of the A. Ph. A., of recent years indicate that his thoughts and energies are now in the direction of the applied sciences and arts. While the professional side of pharmacy has been advancing, as shown in the teachings of the colleges as well as by the report of the Chairman of the Committee

on Practical Pharmacy and Dispensing of the A. Ph. A., so have the opportunities for business enterprise been increasing. The retail pharmacist with a small monopoly of certain products has grown to be in many instances the successful manufacturer. Furthermore, the retail pharmacist of years ago doing a small business with large profits has been met in recent years by an increase in the number of pharmacies sharing these profits. We observe that the same principle which has obtained throughout the professional and business world also applies to the retail pharmacist.

While corporations have been organized, so have individual business enterprises been developed, each contributing its share to the welfare of the race. Unfortunately, many who have not adjusted themselves to existing conditions cannot but refer to the "good old times" and look painfully upon the present. All who fail to read the signs of the times and adapt themselves to the inevitable decrees of commerce find that during this adjustment period they are either partially or wholly losing their grip upon their profession and business. It is the wise man who benefits by the achievements made possible by corporations and yet observes the peculiar advantages of independent professional and business labors.

The retail pharmacist has, in the first place, been met by competition in the numbers who have entered the business solely because of the apparent "millions in it." Some of the more intelligent pharmacists soon recognized, in the supplying of the mediocre class who now swelled the ranks of pharmacy and who were incompetent to make their own preparations, that here was an unusual opportunity of supplying them with pharmaceutical products. This fact, as well as the natural development of the corporation, has made possible the condition which exists to-day.

The evolution of the retail pharmacist is in the direction of the manufacturer, and we witness the large number who either on a small or large scale have developed their business from small beginnings to large and even still greater manufacturing enterprises. The ambition of many college graduates is either to become associated in some way with a manufacturing firm, or himself to become a manufacturer.

Every pharmacist who is true to his profession makes as many of his medicaments as possible. Every pharmacist who makes any medicaments for other than his own use in filling prescriptions, etc.,

is a manufacturer. The more professional and educated the pharmacist is the more likely is he to become a manufacturer, the extent of the products of his manufacture depending upon his abilities and the money at his command. The pharmacist must recognize the inevitable current of commerce, and, according to the mariner he proves himself to be, so is his course either on the sands or rocks, or in the tide that leads him to his highest ambitions. So long as man inhabits the earth there will be sickness and disease, and physicians and pharmacists will be called upon to do their respective duties. With the advance of time there will be more specialization and the field with its opportunities will be larger to those who possess and manifest the true professional spirit. There will be more to satisfy the man with the interests of his profession, providing he recognizes first the situation which confronts him, then his own powers, and finally conducts his life and actions according to his reason and position. The whining pessimist who sees nothing but disaster in the future will be displaced by the high-souled professional man of character and purpose, be it in pharmacy or any other profession.

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## EDITORIAL NOTES AND COMMENTS.

### NOMENCLATURE.

NOTES ON BOTANICAL NAMES.—The matter of the botanical nomenclature of the U.S.P. is of great importance, and while there is little doubt in the minds of the majority that Engler and Prantl should replace Bentham and Hooker as our authority, as already pointed out by Prof. H. H. Rusby, still it is a matter of some concern as to how far we are justified in following even Engler and Prantl as our guide. In a recent letter from Professor Rusby on this matter, which we are permitted to publish, he says:

"I would depart from the authority, however, in cases of obvious error, such as classing *Cimicifuga* as an *Actaea*. In regard to specific names, I would follow the Rochester code, except in matters of style, such as decapitalization. I can see no other road to uniformity and ultimate simplicity, and it appears that everything is working surely, even if slowly, in this direction. Several mistakes made by the last committee, for which I assume the responsibility, are to be

corrected. As to what changes will be required on the above basis, it is a mere matter of detail to work them out. I will here indicate a few which I have in mind, in addition to those enumerated in my A. Ph. A. paper.

" **APOCYNUM.**—Species wholly indefinite, and requires full pharmacological investigation.

" **ASAF CETIDA.**—Add 'and probably from other species of *Ferula*.'

" **ASPIDOSPERMA.**—I think it almost certain that more than one species yields the bark (of good quality) of commerce.

" **ASPIDIUM?**

" **CASTANEA.**—Write '*C. dentata* (Marsh.), Borkh.'

" **CHONDROUS.**—Worked out by Henry Kraemer. See 'Proc. Pennsylvania Pharmaceutical Association,' 1899; also AMER. JOUR. PHARM., 1899, p. 479.

" **CINCHONA.**—After *C. Calisaya* insert *C. Ledgeriana*.

" **COCA.**—I believe that the chemical and therapeutic differences are sufficient to warrant two titles for the Truxillo and Huanuco. Or else let cocaine represent the latter, and let the preparations be made from the former, and make it the official one.

" **EUCALYPTUS.**—I think it should be required that these come from their native home. They apparently differ greatly in quality, as coming from different places where they have been introduced.

" **HEDEOMA.**—The synonym should be 'American Pennyroyal,' and the same qualification should be applied to the oil.

" **IPECACUANHA.**—The relative properties of cephæline and emetine should be investigated, and the advisability of admitting the Carthægena be thus determined.

" **KINO.**—Eucalyptus gum is almost wholly sold for Kino, and it is probably even better.

" **MENISPERMUM.**—The Southern (Texan) is very likely specifically distinct from the Northern.

" **MENTHA VIRIDIS** should be written *M. spicata*, L.

" **MENTHOL.**—Holmes is author of the two variatal names involved. See B.P.

" **PILOCARPUS.**—Drop *P. Selloanus* and perhaps add one or more of the newly-discovered ones. Even then it will be hard enough to meet the demand.

" **RHEUM.**—The B.P. definition is correct.

" **RUBUS.**—Omit *R. Canadensis*.

"**SERPENTARIA.**—Add *A. Nashii*, Kearney.

"**SPIGELIA.**—Tropical species should be tested. They are apparently very good, and should be added. It will be hard enough, even then, to meet the demand with a genuine article.

"**STROPHANTHUS.**—Restrict to *S. Kombé*.

"**VIBURNUM PRUNIFOLIUM.**—Add *V. Lentago*.

"**VIBURNUM OPULUS** ought to be dropped.

"**XANTHOXYLUM.**—I think Engler is correct, as to the Southern species representing a different genus."

**MEDICAL NOMENCLATURE.**—The nomenclature question in all the sciences and arts is one of the greatest moment. In medicine, apparently, it is in a similar chaotic condition. The terms used are at best only symptomatically descriptive, and it is conceded not without reason that medical nomenclature should have an etiological rather than a symptomatic basis.<sup>1</sup>

In an extended communication on this subject, Dr. A. F. McKenzie<sup>2</sup> considers it likely that most new words of the future will be coined by medical men connected with the great medical centres where scientific research is carried on. In regard to the spelling of words, which is closely connected with the subject of nomenclature, the changes proposed by G. M. Gould<sup>3</sup> some years ago have been adopted by many authors.

**UNIVERSAL LANGUAGE IN MEDICINE.**—While Latin is the recognized universal language in the sciences, it appears that in medicine each nation not only has its own home nomenclature, but has employed its own language in communicating the ideas of the physicians to one another as well as to other nations. Some have advised the adoption of the modern Greek as being suitable for a universal language in medicine. Dr. A. F. McKenzie<sup>2</sup> suggests that the English language, although probably greatly altered, may become the medium of exchange of ideas in medicine as well as in commerce. It is safe to say that a universal language must be the result of natural growth and fostered by influences outside of medicine.

**ENGLISH ABBREVIATIONS.**—In the Formulary of the Philadelphia Hospital, published on p. 131, of this JOURNAL, it will be noted that,

<sup>1</sup> *Southern California Practitioner*, 1898, p. 353.

<sup>2</sup> *Dominion Medical Monthly*, 1899, p. 233.

<sup>3</sup> *Philadelphia Medical News*, 1893, June 17.

while the Latin titles of the formulas are retained, a system of English abbreviations has been adopted in indicating the names and quantities of the ingredients. The reason given for such a step is to diminish the false readings in prescriptions by the pharmacist. The plan that has been followed in the Formulary has been to give: (1) the *class* of medicinal products to be used, followed by (2) the *specific member* of the class. Thus Calomel is written: "Mercurous Chloride, Mild;" and Corrosive Sublimate is written: "Mercuric Chloride, Corrosive;" or, "Vallet's Mass" is given as: "Mass, Ferrous Carbonate," or Mucilage of Acacia as: "Mucilage, Acacia;" or Aromatic Sulphuric Acid as: "Ac. Sulph. Arom.;" or Compound Fluid Extract of Sarsaparilla as: "Ext. Sarsap. Comp. Fl." etc.

There are two objections to this system as followed in the Philadelphia Hospital Formulary: (1) Inconsistency in nomenclature of title (in Latin), and names as well as quantities of ingredients (in English). (2) The important benefit from the universal comprehension and interpretation of Latin has been entirely disregarded.

This latter feature is one reason that calls for a more extended use of Latin and of the metric system in the United States, where not only English is spoken, but all the other languages.

A SCIENCE CRIPPLED BY WORDS.—Perhaps no one subject has been placed in such a false light and has yielded so little returns to the pharmacist as the study of botany. A number of causes have been at work, and Walter Bryan<sup>1</sup> believes it to be due to the use of such a large number of foreign descriptive words. Mr. Bryan suggests that these words be exchanged for English words, and believes that botany would be more readily assimilated and practically applied by the student and pharmacist. It is furthermore suggested that the U.S.P. substitute English descriptive words for the foreign botanical terms. This is a matter for serious consideration, and we cannot but agree with the author to a certain extent. We may discuss this subject later in some of its various aspects.

#### THE IDEAL PHARMACOPEIA.

Much has already been written upon the coming U.S.P., and the editor of the *Pharmaceutical Review*<sup>2</sup> makes some very pertinent

<sup>1</sup> Paper read before the King's County Pharmaceutical Society, and contributed to the *Pharm. Era*, 1899, p. 570, for publication.

<sup>2</sup> *Pharm. Review*, 1900, p. 57.

remarks on the ideal pharmacopœia, which he considers to be "an up-to-date treatise that contains concise information with regard to every drug and preparation the modern physician may want to prescribe and which the pharmacist is called upon to dispense; not only of those which are regarded as 'sufficiently important to be made official.'

"The ideal pharmacopœia is one that changes with every step of scientific progress, the change to be made as rapidly as is consistent with good work and in doubtful cases with the best judgment of the Revision Committee. It is not at all necessary to revise the entire book each year or oftener. The new revised edition being published, the Committee should issue circulars with regard to changes or additions to be made. These could either be inserted into the book, so bound as to provide for such additions or changes, or at the end of each year an addendum could be issued comprising all of the information of the circulars. Whenever demanded, a new revised edition could be issued. There is no reason why pharmacopœias should not be completely revised as often as our present dispensaries."

#### THE WAR REVENUE TAX.

It is generally known that the normal receipts from the war tax are far in excess of what is necessary, and the public expect that Congress will certainly at this session at least amend the act creating this revenue so as to strike out those things that cause annoyance and trouble without producing very large revenues to the government. It ought to be said, moreover, that the tax on medicinal preparations falls with crushing weight upon the retail pharmacists of the country, and the resolutions adopted by the Chicago Retail Druggists' Association, at a meeting held January 30, 1900, speak really the sentiment of every retail druggist in the United States, and it is hoped that Congress will come to their relief. We have already referred to this matter editorially (see this JOURNAL, 1898, pp. 354 and 625), in the first case favoring the act, considering the emergencies of the case, and secondly recommending its amendment. The resolutions as adopted by the Chicago Retail Druggists' Association are as follows:

*"Resolved*, By the Chicago Retail Druggists' Association, representing 900 druggists of the city of Chicago, that there is no

longer any reasonable excuse for the further continuance of this unjust and oppressive tax; that said tax, unlike nearly all other taxes imposed by the Government, is not and cannot be shifted to the consumer; that said tax, so long as it is collected, is and must remain an enormous and discriminative burden upon the retail druggists, equivalent to an income tax upon them many times greater than the general income tax, proposed by the Act of 1894, but which, in a suit prosecuted by the financial interests of the East, was overthrown by the Supreme Court.

*"Resolved,* That we earnestly petition Congress to repeal this vexatious and harassing tax. We especially urge our Senators and members from Illinois to use every means in their power to secure its repeal, and we ask them not to abate their efforts by reason of the specious arguments now being put forth by the advocates of big appropriations against such action at the present session. We ask them to consider that the first duty of Congress is to do justice; we ask them to remember that the levying of this tax involves the grossest injustice involved in any tax now levied by the Federal Government; we ask them not to forget that it falls for the most part upon a class of citizens who are already suffering under burdens and disabilities which render it difficult for them to make even expenses in their business.

*"Resolved,* That a copy of these resolutions be transmitted to both Senators and to each member of Congress from Illinois, with the urgent request that they do everything in their power to induce the Ways and Means Committee of the House to report for passage at this session a bill to repeal this odious, obnoxious and oppressive tax."

#### ASAFETIDA IN THE UNITED STATES.

Owing to the importance attached to the commercial purity of asafetida at the present time (see this JOURNAL, 1900, p. 97), the editor of this JOURNAL has been in correspondence with some well-known firms in regard to the purity of this drug in the American market, and the following letter from Lehn & Fink, of New York City, places the matter clearly before our readers:

"DEAR SIR:—We acknowledge receipt of your favor of the 25th ult., in which you desire a statement from us whether a reduction of the limit of purity as established by the Pharmacopoeia for 'Asafetida' is advisable.

"We see no necessity for such a reduction, as suitable grades are always in ample supply in the primary markets, and there is no difficulty in procuring sufficient quantities for use in medicine.

"As to the *commercial* aspect of the question, we beg to report as follows:

"The demand in this market from buyers of large quantities is mostly for a low-priced gum, such as does not meet the requirements of the U.S.P. Asafetida of this description is almost exclusively used for powdering, and, as it contains a large amount of mica and other inert material, is better adapted for this purpose than resinous gum of good quality.

"Jobbing druggists, who in turn supply the retail trade with the whole gum, usually buy good grades.

"There is no difficulty in obtaining asafetida containing 60 per cent. resin and over in the primary markets.

"No restrictions were formerly placed by the customs authorities on the quality that should be admitted to this country. Importers dealt in various grades suitable for various wants.

"The trouble began when the appraiser of the port of New York excluded asafetida not meeting pharmacopœial requirements, which he can do under the law of August 30, 1890, prohibiting the importation of adulterated merchandise. Importers had been accustomed to half-hearted attempts on the part of the appraiser to carry out this law, but they had learned by experience that such attempts, sometimes fully justified, sometimes not warranted, are soon given up and old customs prevail. When restrictions were first placed on asafetida, they were only enforced for a short time; later on importations of inferior grades were again allowed to come in. This state of affairs was embarrassing to some importers, who were quite willing to comply with the requirements established by the appraiser, and when, because of protests, the appraiser's office became more watchful, it still happened that examination of the quality of new arrivals was not carefully carried out, and some importers managed to bring in asafetida which was below standard, while others were compelled to return their shipments. At this stage some importers directed their shipments to ports other than New York, where the supervision was less strict, and this way obtained supplies of low-priced asafetida, for which there is always a good sale, as explained above. This caused those New York im-

porters who were not quite so 'smart' to again complain to the proper authorities, which had the effect of making importation through other ports more difficult. After all, the examination of new arrivals of gum asafetida is not strictly carried out in our opinion, as it has recently happened to us that part of a shipment was refused, although we were unable to detect any material difference in the quality of the rejected part and that which was admitted; in fact, the latter did not quite meet the requirements of the U.S.P.

"This unsettled state of affairs will continue as long as no strict supervision and exact method of examination of every importation into the United States exists.

"Asafetida is not sold according to test abroad, and buying brokers have to use their best judgment whenever making selections of suitable grades for export to the United States; it is evident that an error on the broker's part may put the importer, although he may have the best intentions, to a great deal of annoyance and expense."

#### EXPERIMENTS ON LOWER ANIMALS.

It was commanded of man long ago that "thou shalt not kill." The interpretation that was to be placed upon this commandment was that he should not kill his fellow-man. No restriction was laid upon his taking any other form of life, whether for sport, food or for purposes of experimentation, etc. We are also taught that "to everything there is a season, and a time to every purpose under the heaven," so that there is "a time to kill and a time to heal," etc. The advance of civilization has made it all the more apparent that there was a hidden truth in the words of Voltaire when he spoke of physicians as "pouring drugs, of which they know little, into bodies of which they know less." While certain classes of scientists have been at work giving us a more intimate knowledge of drugs, the experimental physiologist has given us a vast amount of information upon the various functions of the body itself. Beginning with Vesalius, the founder of human anatomy, who by means of his experiments upon living animals laid down the principles of anatomy, we observe the host following, each of whom has, by reason of his observations upon living animals, made possible the "time to heal." By means of vivisection experiments, Harvey demonstrated the circulation of the blood; Lavoisier and Priestly the principles of respiration; Schmidt and Bidder the important

facts connected with digestion and assimilation, etc. As a result of the work of physiologists on living animals, Weber laid down the principles of a rational treatment for the prevention of heart failure; Duhamel and others explained the processes by which wounds are healed, and injured parts restored, and especially how fractured bones are united; Esmarck and others have by use of ligatures inaugurated the era of bloodless surgery, etc. See what vivisection has done in abdominal surgery. In the Civil War, out of 3,717 cases of intestinal wounds, 3,273 ended fatally. Since that time experiments made upon dogs which were etherized and then shot showed the feasibility of opening the abdomen. If what we know to-day had been known then, 3,273 soldiers instead of 446 would now probably be living.

See what experiments upon living animals have accomplished in indicating to us the value of over 150 new remedies introduced during the year 1899. This means that instead of experimenting upon human kind to get this information lower animals have been used. Surely no sane man can fail to appreciate the conditions under which we live. It is man's privilege to save life and no one recognizes the privilege and duty more than the conscientious physician. He will save man, dog, canary bird and even the ubiquitous sparrow. If he can save all, he will, but he must prolong and save man's life under nearly all circumstances and all lower forms of life must be sacrificed if needs be. From the beginning it has been recognized that man was to have dominion over all and that every form of life was to contribute to his life in health and disease. In matters of food hundreds of lives of lower animals are sacrificed for sustaining the life of man, but in medicine comparatively few lives of lower animals are given to the saving of countless millions, as statistics will easily demonstrate. The matter of legislation regarding vivisection and experimentation upon the lower animals can safely be left with the scientists and professional men themselves. It is well to remember that it is the type of man like Darwin who not only hesitates to hurt a living creature, but who recognizes his responsibilities to the whole living world.

There can be no question in the mind of any enlightened person that it should be the highest duty of all to protect every living object, plant or animal, which has any claim whatsoever to our mercy and consideration. Many of the humanitarian and kindred

movements of the present time show that a kindlier and more benevolent spirit is growing in the world, and these should receive our most earnest support in all instances when they do not interfere with what may be considered the real progress of the race; and while we heartily approve of such measures as look to the amelioration of the sufferings and cruelties which those below us in the scale of existence are oftentimes forced to undergo, still we cannot overlook the vast benefit which has been rendered humanity by the large number of experiments upon the lower animals in some form or another. It would seem that humanitarian and scientific movements should co-ordinate one another, particularly when we consider that the large body of experimental physiologists and pathologists are working with the object of lessening the ravages of disease.

#### REVIEWS AND BIBLIOGRAPHICAL NOTICES.

PROCEEDINGS OF THE NEW HAMPSHIRE PHARMACEUTICAL ASSOCIATION AT THE TWENTY-FIFTH ANNUAL MEETING, held at Isles of Shoals, September 6-7, 1898.

The proceedings also contain the report of the Commissioners of Pharmacy.

Charles A. Tufts presented a paper on "Adulterations," in which he enumerated the chief adulterants in foods and drugs.

PROCEEDINGS OF THE TEXAS STATE PHARMACEUTICAL ASSOCIATION, held at Waco, Tex., May 16-18, 1899.

The following is the list of the titles of the papers presented: "What Legislation can be Proposed to Check the Exorbitant Charges Made in this Country by Foreign Manufacturers on the So-called Patent Chemicals as Compared with Prices Asked in other Countries," by Mr. Pfeiffer; "What Should be the Relation of Druggists with One Another in Handling Prescriptions Composed in Whole or in Part of Private Formulae of their Own or of Physicians?" by John Pfeiffer; "Is there Any Difference in Strength or Therapeutic Value Between a Tincture Made by the Regular Method and One from Fluid Extract?" by several authors.

PROCEEDINGS OF THE MAINE PHARMACEUTICAL ASSOCIATION. Thirty-second Annual Meeting, held at Portland, July 6-7, 1899.

A number of papers were presented: "The Pressing Present Need," by W. F. Jackman; "What Standard of Knowledge of the Pharmacopœia Should be held Necessary for Registration in Pharmacy?" by Ernest Jordan; "Abstract of Special Investigations in the Laboratory of the Department of Pharmacy, University of Maine, 1899;" "Notes on Some of the Questions Proposed to Competitors for Prizes in 1899," by H. T. Cummings; "The Relation of the Physician to His Co-worker," by T. J. Stevens; "The Cultivation and Collection of Opium," by E. T. Bowers; "Some Thoughts on Beginning the Study of Pharmacy."

**VIRGINIA PHARMACEUTICAL ASSOCIATION.** Proceedings of the Eighteenth Annual Meeting, held at Natural Bridge, July 18-20, 1899.

The proceedings contain reports of officers, but no original papers were presented.

**NEW JERSEY PHARMACEUTICAL ASSOCIATION.** Proceedings of the Thirty-ninth Annual Meeting, held in Atlantic City, May 24-25, 1899.

The following are the titles of the papers presented: "The Pharmacopoeia and Examinations," by Wm. C. Alpers; "Poor Lime Water," by Pierce P. Bear; "Lime Water," by George E. Thum; "A History of Umbelliferous Plants," by P. E. Hommell.

**BULLETIN OF THE NEW YORK BOTANICAL GARDEN.** Vol. I, No. 4.

This report contains, besides reports of the officers, various botanical contributions.

**BULLETIN OF MISCELLANEOUS INFORMATION.** Botanical Department, Trinidad. Vol. III, Parts 8, 9, 10, 11.

These bulletins contain, as usual, a number of notes on economical plants growing in Trinidad.

**BULLETIN OF MISCELLANEOUS INFORMATION.** Royal Gardens, Kew. Nos. 139, 143, 147-150.

These numbers contain valuable information on economical plant subjects.

**PLANTES MEDICINALES ET TOXIQUES DU DEPARTEMENT DE L'HÉRAULT.** Par le Dr. Louis Planchon.

A list of plants with their scientific, French and local names, together with geographical distribution, part employed and uses, which were exhibited at the exposition at Montpellier, in 1896, for the department of l'Hérault.

**LA NATURALEZA.** Segunda Serie. Tomo III. Guadernos Números 3 y 4. This number of the Natural History Society of Mexico is principally devoted to a voluminous and important paper on the ornithology of Mexico, by Alfonso L. Herrera. The paper is illustrated with a large number of large colored plates of the more prominent birds of Mexico.

The following papers have been published in the Transactions of the Academy of Science of St. Louis:

**NOTES ON SOME WESTERN WILLOWS.** By C. R. Ball. This paper contains the results of a systematic and comparative study of over thirty species and their varieties of Western willows.

**ON TEMPERATURES IN GASEOUS NEBULÆ.** By Francis E. Nipher. The paper deals with the conditions in a gravitating nebula having uniform temperature throughout its mass, on the assumption that the initial temperature diminishes from the centre outwards.

**THE PROCESS OF FERTILIZATION IN ASPIDIUM AND ADIANTUM.** By Charles Thom. This is an important paper on plant cytology and adds to our knowledge of fertilization in those plants marking the boundary line between the lower and higher plants.

## MINUTES OF THE PHARMACEUTICAL MEETING.

The regular monthly Pharmaceutical Meeting was held Tuesday, February 20th, with Mr. Richard M. Shoemaker, a member of the College and a member of the old-established drug firm of Robert Shoemaker & Co., in the chair.

The first speaker on the programme was Prof. Samuel P. Sadtler, who gave a very interesting talk on "Mineral Tannage," illustrating the same with specimens.

It may be mentioned here that Professor Sadtler has been employed for the past seven years as an expert in litigation concerning tanning processes and has in that connection patented two processes for chrome tanning.

In describing the skins which are used for making leather, he said that in ordinary usage the skins of larger animals are known as hides, whereas those of smaller animals are known as skins. He said that the animal skin, owing to the processes which have been used for removing the hair and otherwise cleansing it, is in an extremely sensitive condition when ready for tanning, and if exposed to high temperature soon spoils, or if dried in this condition it becomes like parchment.

Coming, then, to consider the subject of tanning, the speaker said that chemists differ as to whether the process involved in tanning is a chemical or a mechanical one. A number of methods have been used for converting animal skins into leather, and of the processes now in use that of tanning by the use of vegetable extracts or infusions containing tannic acid was the earliest known. In this process the tannin combines with the fibre of the skin so that it does not become parchment-like on drying. Later it was discovered that certain mineral salts have a similar effect on the skins, the processes involving this action being grouped under the head of mineral tannage or tawing. Still another process of tanning is that involving the application of oil to the skins and its subsequent oxidation.

Alum was one of the first of the mineral salts to be used for tanning purposes, but is found to be distinctly inferior to tannic acid in this respect, owing to the fact that, when the leather is put into water, the alum is washed out and the leather becomes parchment-like on drying. Later it was found that other oxides like those of iron ( $F_2O_3$ ) and chromium ( $Cr_2O_3$ ) had the property of combining with hide fibre. The iron salts do not appear to be very satisfactory in this respect, however, as the leather becomes hard and brittle.

For our earlier knowledge of chrome tanning we are indebted to the German chemists, Knapp and Heinzerling. The chrome tanning industry has, however, assumed the greatest proportions in this country, Philadelphia being its chief centre, and in recent years a number of patents have been taken out for various modified processes. One of the first of these was the Schultz patent process, which, though slow to be adopted by tanners, has proved of great value, and has been the occasion of much litigation extending from 1892 to the present time, owing to the number of infringements of the patent. The process, briefly stated, is (1) to treat the skins with a solution of potassium bichromate in the presence of acid, which liberates chromic acid ( $CrO_3$ ); (2) then to put them into a bath of an acidified sulphite or hyposulphite for reducing the chromic acid, whereby chromic oxide ( $Cr_2O_3$ ) is produced. The chrome tanning process has been found to be particularly applicable to light skins, such

as kid, goat, sheep, etc. The leather produced in this way is insoluble in water, and is superior to bark-tanned leather in the respect that it does not stretch. Its superiority to alum skin lies in the fact that it can be washed without becoming like parchment. If the tanned skins are taken before they have become perfectly dry, they may be readily given any shade of color.

The methods in use for chrome tanning are known as "one-bath" and "two-bath" processes. According to the first, the skins are subjected to the action of green chromium salts at once, and according to the latter they are impregnated with chromic acid in the first bath, and in the second treated with reducing agents. The "two-bath" process is considered to be the more valuable.

A number of two-bath processes other than the Schultz method were described by the speaker, the principal difference in these methods being due to the use of different reducing agents. The reduction is accomplished with: (1) alkaline sulphides and acid (Norris and Little); (2) hydrogen sulphide gas (Norris); (3) hydrogen dioxide or peroxides (Sadtlar); (4) lactic acid (German patent by Böhringer); (5) hydrosulphurous acid (Norris); (6) nascent hydrogen, electrolytic (Sadtlar).

The principal one-bath processes in use are the Martin Dennis and that known as "Eureka Tannage." In the first a solution containing chromium chloride and chromium hydrate, and sold under the name of "Taunolin," is used. The second of these processes was patented by G. W. Adler and consists in using a solution of chromium chloride or sulphate and acetate of soda.

The speaker remarked in this connection that a book was published in Germany two years ago on chrome tanning patents, which showed that three-fourths of these patents have been developed in the United States.

One of the most recent methods for coagulating the fibre of skins is that involving the use of formaldehyde. Dr. Charles S. Dolley, of Philadelphia, who has developed this method, was present, and was asked to make some remarks on it. He first referred to the use of formaldehyde for fixing animal and vegetable tissues in microscopic work, and said that its property of acting on the collagen of animal skin renders it of value in the production of leather. The advantages claimed for this leather were: that it may be put into hot or cold water without becoming hard or going back again as tanned leather. It seems to stretch very little and it was thought that perhaps formaldehyde is a better fixing agent than chromic oxide; it comes out of the formaldehyde bath almost white and is perfectly neutral to colors; owing to its suppleness it is used for valves, etc., and is thought to be more uniform in texture than chrome tanned leather. It was also stated that the method of tanning by the use of formaldehyde has the advantage of being performed in a comparatively short time. The principal drawbacks to this method are the disagreeable properties of the gas and its tendency to polymerize.

Commenting upon Dr. Dolley's remark in regard to the texture of chrome tanned leathers, Professor Sadtlar said that in order to produce a uniform product the process of reduction must be thoroughly carried out and the acid afterward neutralized by an alkaline bath.

Prof. Jos. P. Remington expressed himself as being very much pleased with the remarks on the above subject, and said that it seems strange that the achievements pertaining to the chemistry of this industry should be reserved

for the nineteenth century. He wished to know how the leather prepared according to these various new processes compared in durability to that prepared with tannic acid.

Replying, Professor Sadtler said that sole leather is still made by the use of tannin, as it is desirable to have the leather built up slowly. He remarked also that 45,000,000 goat skins alone are imported into this country annually, and that when we consider the magnitude of the tanning industry, it soon becomes apparent that an economy of time and expense becomes of prime importance.

A distinction which Dr. Dolley noted was that the heavy leathers are sold by weight. The phlobaphene or coloring matter of the vegetable tanning material is taken up by the skins, so that in the leather sold by weight a certain proportion of the weight is vegetable substance.

W. E. Ridenour read a paper on "Soluble Ferric Pyrophosphate." (See page 125.)

Mr. J. W. Englund commended Mr. Ridenour's work very highly. He was especially interested in the reference made to possible reversion of pyrophosphate to phosphate, when the former is in solution in the presence of free acids, and thought that this factor with that of oxidation might explain, perhaps, the variability in composition of commercial scaled iron pyrophosphate, and the proneness to change of the triple elixir of iron, quinine and strychnine, made with the soluble ferric pyrophosphate. He said that many of the triple elixirs of commerce, so far as the iron constituent was concerned, were made with soluble phosphate of iron or citro-chloride of iron. Such products, he thought, did not give as good clinical results as did the elixir made with the soluble iron pyrophosphate, though they were less prone to change in composition. A perfect formula for making triple elixir from the sol. iron pyro. had not, so far as he knew, yet been devised.

A paper on "Crocus and Some of Its Adulterants," which was illustrated by specimens, paintings and drawings, was presented by William S. Weakley, assistant in the Botanical Laboratory of the College (see page 119).

A feature of the meeting was an exhibition of a variety of interesting and valuable specimens. Prof. F. G. Ryan called attention to quite a collection of specimens of crude opium, which showed how opium is put up in different countries. The collection also contained some "false" opiums and adulterants of opiums. The exhibition was made through the courtesy of Messrs. Gilpin, Langdon & Co. Professor Remington also remarked upon the special interest of the specimens and exhibited some adulterants of opium which he had procured for his cabinet.

In this connection, Mr. F. W. E. Stedem remarked upon the peculiar red color of some deodorized tincture of opium which he had made from opium which had the proper assay value.

Professor Remington said that the red poppy is very common in European countries, but that the flowers of the plant yielding official opium are white.

Prof. F. X. Moerk called attention to a collection of representative samples of the fertilizer industry, which were obtained from Baugh & Sons Co., of Philadelphia, through Mr. Geyer, one of our graduates, and which he said may be briefly mentioned in the order of their valuable constituents.

*Potassium Salts*: Kainite, with samples of potassium sulphate and magnesium sulphate, obtained from the same; Potassium chloride from either Sylvite

or Carnallite; these come from the celebrated deposits at Stassfurt, Germany. Another mineral from the same locality is Kieserite, having the formula  $MgSO_4 \cdot 7H_2O$ , used to make the official salt  $MgSO_4 \cdot 7H_2O$ .

*Ammonia*-yielding materials: Ammonium chloride and sulphate obtained from the ammoniacal liquors of the gas-works; sodium nitrate or Chili saltpetre.

*Phosphoric acid*-yielding materials: Phosphate rock from Tennessee, which is found more desirable than that from South Carolina, because of the ease with which it can be ground; bone and bone-products, bone-black or animal charcoal, bone ash or crude calcium phosphate, and a sample of asphaltum produced in the destructive distillation in which bone-black is obtained. A number of these samples are also in what is called "dissolved" form, which simply refers to the treatment with the proper quantity sulphuric acid and evaporation to pulverulent form, by which the calcium phosphate is rendered soluble in water. Lastly, a good line of fertilizers are shown, adapted to particular crops, such as wheat, potatoes, tobacco, etc.; these differ from each other by varying proportions of potash salts, soluble phosphoric acid and ammonia-yielding materials.

Mr. Shoemaker exhibited some particularly fine samples of senna pods, and in reply to some questions by Prof. Henry Kraemer said that they are replacing the senna leaves to a considerable extent and by some persons are considered to be more efficient than the leaves, and at the same time less griping in their effects. They have been used mostly by the manufacturers of proprietary remedies.

On motion, the meeting adjourned.

FLORENCE YAPLE,  
*Secretary pro tem.*

## AMERICAN PHARMACEUTICAL ASSOCIATION.

### SECTION ON EDUCATION AND LEGISLATION.

The following is a list of queries submitted by the Section on Education and Legislation:

- (1) A draft of a "uniform poison law," with penalties for violation of the same.
- (2) A draft of a "pure food law," with penalties attached for adulterations.
- (3) What amount of pharmaceutical education is being given to the medical students of the present time, and how far do they profit by it?
- (4) Who is responsible for the large growth in the use by physicians of proprietary articles? How can this tendency be best controlled?
- (5) What practical steps can be taken by the Association towards the repeal of the present unjust trade-mark laws?
- (6) To what extent have pharmacists been benefited by pharmacy laws?
- (7) To what extent are these laws observed by pharmacists?
- (8) Some of the pharmacy laws recognize only "registered pharmacists," others have an additional class called qualified assistants; which is preferable?
- (9) Under what restrictions should pharmacists be permitted to sell liquors?
- (10) Should pharmacy boards be supported by the fines and fees accruing through the administration of the law, or by direct appropriation from the State treasury?

- (11) What are the arguments, *pro* and *con*, for the admission of some of the more important of the new synthetic remedies into the U.S.P.?
- (12) Give a list of those whose admission would seem desirable, and the names under which they should be admitted.
- (13) A dose list is wanted for the articles official in the U.S.P., and in addition the maximum amount that can be given in twenty-four hours.

SPECIAL COMMITTEE ON WEIGHTS AND MEASURES.

At the request of F. G. Ryan, Chairman of the Special Committee on Weights and Measures, we present the following:

"The Committee on Coinage, Weights and Measures of the House of Representatives is again considering the subject of the adoption of the metric system of weights and measures as the legal system of the United States—with a view of presenting a report to Congress upon this subject. The Chairman of the Special Committee on Weights and Measures of the American Pharmaceutical Association would urge all members of the Association and all pharmacists of the United States who favor the adoption of the measure to write to the Hon. James H. Southard, Chairman of the House Committee, Washington, D. C., presenting their views upon this subject."

"Probably no class of persons would be more benefited by the adoption of this measure than the pharmacists of this country, hampered and annoyed as they now are by being compelled to use avoirdupois and apothecaries' weight, wine measure, and, in some sections, imperial measure, as well as the metric system.

"Since the foundation of the Republic there probably has never been a time when the importance of this subject was more apparent than it is at present. With the acquirement of new territory in distant parts of the world, and the increase of our commerce with foreign nations, a universal system of weights and measures becomes more than ever desirable. Pharmacists of the United States are to be congratulated on the advanced position they have taken in securing the adoption of the metric system exclusively, by the United States Pharmacopoeia in 1890, and it is hoped that they will continue to aid in securing its adoption by Congress as the only legal system of weights and measures in the United States."

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## CHICAGO COLLEGE OF PHARMACY.

The Alumni Association of the Chicago College of Pharmacy held the first of its series of meetings for the discussion of pharmacopœial revision in the parlors of the Palmer House on Thursday evening, February 8th.

The meeting was called to order at 8 o'clock, President W. B. Day presiding. Notwithstanding the very stormy weather there were twenty-four members in attendance.

The first speaker was Prof. C. S. N. Hallberg, delegate to the Convention from the Chicago College of Pharmacy, and his subject, "General Observations on the Revision of the Pharmacopœia." The Professor gave an outline of the manner in which the work of revision is accomplished, and as a member of the last Revision Committee, recalled the problems that had con-

fronted the revisers in 1890. He then dwelt very briefly on the more important suggestions that had been made since the last revision, and will probably come before the Convention, and indicated some of the changes in the Pharmacopeia that are likely to be made.

Following this address, Dr. J. A. Patten, delegate to the Convention from Rush Medical College, read a paper upon "The Revision of the Pharmacopeia from a Medical Point of View." The doctor presented suggestions collated from several sources and representing the opinions of quite a large number of physicians concerning the popularizing of the Pharmacopeia among medical practitioners. Chief among these suggestions were: Simplification and condensation of the text through the reduction in the number of classes of remedies and the omission of many preparations; for example, it was suggested that there be but one solid and one liquid preparation of each vegetable drug; the inclusion of a table of doses, either in the text or the appendix; insertion of information concerning new remedies, possibly even to the extent of issuing an annual supplement bringing such information up to date; standardization of galenicals, chemically and perhaps physiologically. The author disclaimed responsibility for some of these suggestions and stated that he would not at this time commit himself as favoring them, but presented them as suggestions emanating from medical men.

In the discussion which followed it was pointed out that it was not so much the desire of the framers of the Pharmacopeia to have physicians actually possess the work as it is to bring before them, by introduction into the Pharmacopeia, and from thence through the dispensaries and works on *materia medica*, such drugs and pharmaceuticals as are likely to prove of value in medical practice.

The papers referred to above, being of general character, necessarily introduced many important topics, time for discussion of which could not be allowed. Several of these topics are so important that later meetings will be devoted entirely to them. One of these, "Standardization," will be the subject for discussion at the next meeting, which will be held at the same place on Wednesday evening, February 21st.

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UNIVERSITIES AND ORIGINAL INVESTIGATION.—Thomas Dwight believes it is not the duty of universities to urge, much less to force, original investigations on students. It should be on hand for those whose zeal is so great that it will take no denial. He would not give more prizes, but of scholarships for deserving men we can hardly have too many. As to the encouragement and support of investigation in its faculty, it is the primary object of the professor to teach, but there are cases where it is necessary for his reputation and influence to do some original work, and the university should assist, especially in the financial needs of this. The best plan would be to place a sum in the hands of the professor at the head of each scientific department, to be spent for the good of that department, including publications. If the individual lacks discretion in the use of this fund, a check to the system would naturally follow.—*Jour. Am. Med. Assocn.*, 1900, p. 157.